Technical Report 830

The Determinants of Job Satisfaction: A Multidisciplinary, Multivariate Analysis of the U.S. Army

Hyder A. Lakhani

February 1989

DTIC
ELECTE
MAY 24 1989
S E D

United States Army Research Institute
for the Behavioral and Social Sciences

89   2   049

U.S. ARMY RESEARCH INSTITUTE

FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency Under the Jurisdiction
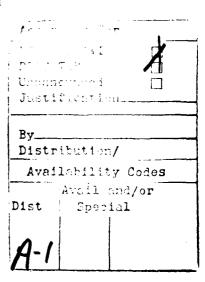of the Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Technical Director

JON W. BLADES
COL, IN
Commanding

Technical review by

Melvin J. Kimmel
Gail McGinn, U.S. Army Community and Family Support Center

NOTICES

REPORT DOCUMENTATION PAGE		Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION	1b. RESTRICTIVE MARKINGS
Unclassified	--

2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT
--	Approved for public release;
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	distribution unlimited.
--	

4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
ARI Technical Report 830	--

6a. NAME OF PERFORMING ORGANIZATION	6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
U.S. Army Research Institute	PERI-RP	--

6c. ADDRESS (City, State, and ZIP Code)	7b. ADDRESS (City, State, and ZIP Code)
5001 Eisenhower Avenue Alexandria, VA 22333-5600	--

8a. NAME OF FUNDING/SPONSORING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences	8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
		--

8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS			
5001 Eisenhower Avenue Alexandria, VA 22333-5600	PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
	63731A	792	242	H5

11. TITLE (Include Security Classification)
The Determinants of Job Satisfaction: A Multidisciplinary, Multivariate Analysis of the U.S. Army

12. PERSONAL AUTHOR(S)
Lakhani, Hyder A.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM 86/10 TO 87/05	1989, February	

16. SUPPLEMENTARY NOTATION

Cont'd From Pg. V

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Job satisfaction Army experience survey, Logit model;
			Economics Factor analysis, Veterans (AW)
			Psychology Sociology,

19. ABSTRACT (Continue on reverse if necessary and identify by block number)
This report analyzes the effect of economic, psychological, and sociological variables on job satisfaction in the Army and Reserve/National Guard units. It uses data from the Army Experience Survey, 1985. The results reveal that variables from all of the three disciplines play a role in determining job satisfaction in the Army and the Reserve/National Guard units. Key words:

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE (Include Area Code)	22c. OFFICE SYMBOL
Hyder A. Lakhani	(202) 274-8119	PERI-RP

DD Form 1473, JUN 86   *Previous editions are obsolete.*   SECURITY CLASSIFICATION OF THIS PAGE

The Determinants of Job Satisfaction: A Multidisciplinary, Multivariate Analysis of the U.S. Army

Hyder A. Lakhani

The Personnel Utilization Technical Area of the Army Research Institute (ARI) performs multidisciplinary research in the areas of soldier family, retention, and readiness. Questions have recently arisen regarding the Army's ability to increase job satisfaction to improve soldier performance and readiness.

The research presented in this report quantifies several of the economic, psychological, and sociological variables thought to affect job satisfaction of enlisted soldiers in the Army and in the Reserve component.

This research was sponsored by the Director, Program Analysis and Evaluation, U.S. Community and Family Support Center. The results of this research were furnished to Ms. Gail H. McGinn, Director, Program Analysis and Evaluation Office, Community and Family Support Center. She indicated that the results will be used to initiate or expand family programs that increase soldier satisfaction with spouse and children, which, in turn, tends to increase job satisfaction, readiness, and retention.

EDGAR M. JOHNSON
Technical Director

THE DETERMINANTS OF JOB SATISFACTION:
A MULTIDISCIPLINARY, MULTIVARIATE ANALYSIS OF THE U.S. ARMY

EXECUTIVE SUMMARY

Requirements:

The U.S. Army Research Institute (ARI) conducts research on manpower, personnel, training, and family issues of significance and interest to the U.S. Army. Questions have been raised about the Army's ability to increase overall job satisfaction to improve soldier performance and readiness and reduce separations.

Procedure:

The author used data from the Army Experience Survey, 1985, which asked enlisted veterans to recollect on job satisfaction while serving in the Army and in the Reserve component. An exploratory factor analysis technique was used to reduce approximately fifty variables from economics, psychology, and sociology to eight clusters. These factor scores and other control variables were used as predictors to explain job satisfaction.

Finding:

The results suggest that variables from all of the three disciplines are significant in increasing job satisfaction in the Army and in the Reserve component. The most important explanatory variable for enlisted soldiers is career commitment (psychological), followed in order of importance by the effect of Army service on satisfaction of relationship with spouse during Army service (sociological) and veteran's income (economic).

Utilization of Findings:

This research shows that policymakers should consider economic variables such as adequate military pay and psychological and sociological variables for increasing overall job satisfaction in the Army.

THE DETERMINANTS OF JOB SATISFACTION:
A MULTIDISCIPLINARY, MULTIVARIATE ANALYSIS OF THE U.S. ARMY

CONTENTS

LIST OF TABLES

THE DETERMINANTS OF JOB SATISFACTION:
A MULTIDISCIPLINARY, MULTIVARIATE ANALYSIS OF THE U.S. ARMY

1.0 Literature Review

Job satisfaction is a subject of interest to several disciplines. Economists are interested in it in order to understand job performance, which is a proxy for labor productivity. Economists measure labor productivity in terms of output per unit of input, such as labor. While these measures can and have been used for the aggregate economy and in agricultural and manufacturing industries (Hildebrand and Liu, 1965; Walters, 1968; Kendrick, 1977; Gollop and Jorgenson, 1980, Baumol, 1985; Norsworthy and Zabala, 1985), they are difficult to use in service industries because it is difficult, if not virtually impossible, to define output in these industries. It is suggested in this paper that in such service industries as the government, in general, and the U.S. Army, in particular, job satisfaction can be used as a proxy for productivity. An increase in job satisfaction can increase productivity by decreasing absenteeism, work stoppages, and labor turnover. Social, industrial, and organizational psychologists are interested in job satisfaction for understanding career commitment, motivation, and job turnover. Sociologists are interested in job satisfaction for understanding its effect on the quality of life, in general, and, in particular, on family life -- whether increase in job satisfaction increases or decreases satisfaction with family life and vice versa. Each of these disciplines, however, tends to analyze job satisfaction by using variables of its specific discipline only. Each discipline ignores the influence of variables of other disciplines by assuming that they are held constant. In multivariate analysis, it is assumed that these variables are subsumed in the error term of the equation. Statistically, exclusion of relevant variables from an equation results in an omitted variables bias in the estimated equation. A few analysts who included variables of another discipline have found them to be significant. For example, the inclusion of affective variables in an economic human capital wage equation significantly changed the estimated educational coefficients for those at higher educational levels (Filer, 1981). If the variables of all the disciplines are included in an analysis, the relative importance of the explanatory variables can be determined. Such an analysis can help policy makers in adopting or changing policies that can increase job satisfaction which, in turn, can improve job performance and also reducing job turnover.

The literature on interdisciplinary research reveals that there has been considerable criticism of the theory and practice of an academic discipline by writers of another discipline. For example, economists assume that individuals always make "rational" decisions. Sociologists and psychologists have long disputed this "naive rationality" assumption of economists. Amital Etzioni (1986), a sociologist, titled his paper, "Rationality is an Exception Rather than a Norm." He has recently advocated development of what he calls "socio-economic" (The Washington Post, 1987) to encompass economics and sociology. Psychologists have developed a new theory called "economic psychology" to explain human behavior by blending economic and psychological variables (Lea, Tarpy and Webley, 1987). Criticisms of this type have also begun to appear in the economics literature (see for example, Elster, 1985; Hirshleifer, 1985; Kahneman and Tversky, 1979; Thaler, 1980; and Schoemaker, 1982). These critiques rightly point out that economists tend to optimize pecuniary costs (dollar values of output for producer) and benefits (or utility for consumer) of individual decisions and relegate non-pecuniary and non-informational aspects of decisions to the concept of "noise" associated with the decision. These critics

use findings from other fields to argue that rationality cannot provide an adequate basis for the description of human behavior. They point out that rational behavior depends upon available information. Economic theory assumes availability of perfect information and perfect knowledge. In practice, there are constraints. Psychologists call them cognitive dissonance or sour grapes for the fox. Since producers and consumers might not minimize costs or maximize utilities, a psychological theory of "satisfying" instead of "minimizing or maximizing", propounded by Herbert Simon (1959), a Nobel Laureate in economics, found a footing in economics. He noted that producers are also interested in maintaining their market shares or in increasing employment and satisfaction levels of their employees, apart from minimizing costs or maximizing profits. Empirical verification of the "satisfying" theory is, however, conspicuous by its absence.

Psychologists attempted to analyze productivity and job satisfaction in separate equations as well as the relationship between productivity and job satisfaction in a single equation. The computerized literature search on job satisfaction, motivation and productivity indicated over 7,000 references. Only the most relevant reviews of this literature are included in this discussion. The relationship between job satisfaction and productivity is postulated to be positive on at least three major counts (Schwab and Cummings, 1970). First, the view that satisfaction leads to performance is based on early human relations concepts. Parker and Kleemeier (1951) note that "management has at long last discovered that there is greater production, and hence greater profit, when workers are satisfied with their jobs. Improve the morale of the company and you improve production". Similarly, Vroon (1964) notes that, "human relations might be described as an attempt to increase productivity by satisfying the needs of employees". In the context of the Army, prevalence of high morale, particularly in the combat arms, can lead to increased productivity. Strauss (1968) notes that "early human relationists viewed the morale-productivity relationship quite simply: higher morale would lead to improved productivity." The second reason for positive satisfaction-productivity relationship is that it is moderated by a number of confounding variables. Herzberg et al. (1959) and Herzberg (1966, 1968) separate job variables into two groups, hygiene or physical environmental factors and motivators. The hygiene factors include such variables as supervision, physical working conditions, company policies, etc. These are viewed as sources of dissatisfaction. The motivators include challenging assignments, recognition, opportunity for professional growth, etc. Herzberg (1968) notes that the low performance-satisfaction correlations obtained by some other researchers are due to confounding effects or aggregation bias of the hygiene variables. An analysis that controls for these hygiene variables increases the satisfaction-productivity correlation. The third reason for postulating a positive relationship between satisfaction and performance is based on the view that performance leads to satisfaction (instead of job satisfaction leading to improved performance). Lawler and Porter (1967) argue that "... good performance may lead to rewards, which in turn lead to satisfaction". Vroom (1964) found that the correlation between satisfaction and performance is positive in 20 of 23 cases and the median correlation is (+.14). Vroom's weak (because of only + .14) results on positive relationship have been improved in a number of studies by Lawler (1967) and Porter and Lawler (1968). It must be noted that while a correlation between satisfaction and performance (a proxy for productivity) fails to indicate causation from job satisfaction to performance (since Granger's causality test is not performed in these studies) or vice versa, the positive sign of the coefficient suggests that there is an absence of

negative correlation between job satisfaction and performance. The low value of the correlation coefficient, however, indicates only a weak relationship which calls for adjustment of the aggregation bias produced by confounding variables.

The controversy between the second and the third reasons, namely, whether job satisfaction leads to improved performance or improved performance leads to increased job satisfaction can perhaps be bridged by the theory of motivation to produce (March and Simon, 1958). In this model, both satisfaction and performance can serve as dependent variables. This model suggests that performance is a function of two variables: (1) the degree of dissatisfaction experienced, and (2) the perception of the effect of performance on the attainment of valued reward. It must be noted that this model suggests that job dissatisfaction is a necessary but not a sufficient condition for performance. It is necessary to bring about motivating behavior. It is not sufficient because a dissatisfied worker may not perceive that performance will bring about the valued reward which is postulated in the second explanatory variable.

The preceding discussion on job satisfaction and performance in the civilian sector is relevant for the Army because of a number of reasons. For instance, since 1972, we have an All Volunteer Force so that Army recruiters compete in the civilian sector with all other recruiters for high quality recruits by providing competitive pay, benefits and career opportunities. Occupational training in the Army is provided for over one hundred specialties. Many of these occupations involve **general**, rather than **specific** human capital. The general training is readily transferable to the civilian sector (Mangum and Ball, 1987). The Army spends about 10 percent of its budget of $80 billion on basic and advanced individual training. As in the civilian sector, promotions in the Army are based on performance which is measured in terms of Skill Qualification Test scores for specific Military Occupational Specialty. Confounding variables like dissatisfaction with supervisors, combat duties with considerable stress due to requirement of continuous vigil, family problems due to frequent permanent change of station (PCS) moves and absence or autonomy prevail in the Army to bring about job dissatisfaction. It is because of absence of control for these confounding variables as well as the exclusion of variables from psychology and economics that Blair and Phillips (1983) found lower level of overall job satisfaction in the military compared to civilian sector. Finally, the decision to stay in the Army is a voluntary decision of a soldier at the end of a specific two-, three-, or four-year enlistment term. The Army competes with civilian employers for retaining good soldiers by offering them Selective Reenlistment Bonuses, retraining to specialize in specific occupations selected by soldiers, liberal leave for college education and a choice of returning to the Army as enlisted soldiers or as officers.

Sociologists have been critical of economists for ignoring social values. They have been attempting to integrate economic and sociological theories of productivity, employment, unemployment, and compensation (Farkas and England, 1984). Sociologists have also been critical of psychologists and have been attempting to integrate behavioral patterns studied by psychologists into a pattern of "attitudes" and their impact on a "belief system" (Farkas, Libby and Stromsdorder, 1987). Finally, economists have been critical of psychologists and sociologists because they exclude economic variables and mostly use univariate or bivariate instead of multivariate models. Recently, economists have been applying economic models and econometrics to sociological and psychological

3

topics such as charity, leisure, marriage, divorce, health, suicide, fertility, discrimination, politics, crime, absenteeism, education, social capital, etc. (Willis, 1986; Coleman, 1986; Fuchs, 1986). Hirschleifer (1985) notes that this invasion of economists of other fields has a flip side. "While scientific work in anthropology and sociology and political science and the like will become increasingly indistinguishable from economics, economists will reciprocally have to become aware of how constraining has been their tunnel vision about the nature of man and social interactions" (p. 53). Also, economic analyses suggest that all the outcomes are optimal. In practice we live in a world of "second best" and "compromises". In short, it appears that every discipline is attempting to take over other disciplines instead of enriching them by cross fertilization.

The available literature on criticism of other disciplines as well as the integration of two or more disciplines have been mostly conceptual, while the empirical literature remains restricted to a single discipline. For example, economists generally relate job satisfaction to labor market experience, relative wage, human capital, unionization and characteristics of a plant or a firm within an industry (Dalton and Mareis, 1986; Borjas, 1979; Freeman, 1978). The importance of economics in an interdisciplinary analysis of job satisfaction rests not only on the inclusion of specific economic facets of job satisfaction, such as wages and benefits, as is often recognized by psychologists and sociologists, but also on the fact that economists emphasize **relative values** such as civilian wage potential of military personnel compared to military pay. Similarly, sociologists and psychologists explain job satisfaction in terms of attitudes, chances of promotion, job security, environment, satisfaction with peers and supervisors, motivation and career commitment. A limitation of social and psychological studies is that only a few of these sociological or psychological studies use multiple regressions. A recent book reviewed over 2,000 separate studies and notes that multiple regression studies are fewer than a handful (Hopkins, 1983).

An objective of this study is to undertake a multiple regression **empirical** analysis of determinants of overall job satisfaction by postulating it as a function of variables from economics, psychology and sociology. These variables include education levels of soldiers, adequate pay, satisfaction with family life, satisfaction with the job environment comprising peers and supervisors, reasons for entering or exiting from the Army, etc. The model is tested for veterans who were in active duty and some of whom are currently serving in Reserve/National Guard Units.

The rest of this paper is organized as follows. Section 2 describes the survey design and methodology for conducting the Army Experience Survey, 1985. This survey asked several questions on recollections of overall job satisfaction of Army veterans while they were in service and that in Reserves/National Guard Units, in case the veterans were active members of these units. As it is virtually impossible to include over a hundred explanatory variables in a few specific equations, (because a degree of freedom is lost for each variable included in an equation), in Section 2 we also employ a data reduction technique by estimating factors for 50 relevant variables. The results of estimating equations for job satisfaction in the Army as well as in the Reserve/National Guard units are reported in the third section. The last section reports conclusions and policy implications of the results.

4

2.0 Army Experience Survey, 1985, and Factor Analysis

A stratified random survey of Army enlisted veterans who separated between 1 October 1981 and 30 September 1984 was conducted in 1985 (Westat, 1986). The sample was randomly selected from administratively maintained Enlistment Master Files (EMF). Stratification was done only for the first term separates and attritees. Women, Hispanic, and high quality veterans (those who had scored in the upper half of the Armed Forces Qualification Test) were over-sampled by assigning them appropriate weights to obtain their representative size. The over-sampling was also done randomly. The selected weighing methodology reduced the bias due to both "no finds" of the veterans sorted from the EMPs and nonresponse of the surveyed individuals. The weighing technique also reduced sampling errors (Westat, 1985). The mail survey (with telephone follow-up) contacted over 8,000 veterans and nearly 4,500 of them responded. The respondents included four groups of veterans: (i) attritees who did not complete their initial enlistment term, (ii) separates who had completed their first terms of service, (iii) mid-careerists who had served more than one tour but left before retirement, and (iv) careerists who had retired after 20 or more years of service. Veterans in the first three groups were also asked if they were members of Army Reserve or National Guard Units at the time of the survey. The survey included over one hundred variables for all the four groups. We extracted a sample of veterans who had served in groups (i), (ii), and (iii) and were also in the Reserves. Veterans who had completed twenty years of service (group iv) were excluded because an analysis of soldiers who left prior to retirement can help policy makers take measures to reduce future turnover. The job satisfaction level of this group of veterans indicates their recollections of the satisfaction levels they had experienced while working. This is a desirable feature because when employees are actually working on their jobs, they may not voice job dissatisfaction for fear of reprisal, despite assurance of maintenance of confidentiality. The samples are also comprised of veterans who were actually performing their jobs as the Army Reserves/National Guards when they were surveyed. It will be interesting to examine if there is a difference in the response of veterans who served on active duty versus those who are serving in the Reserve Component.

As there were several missing values for many of the variables, we sorted all of the variables to select variables that (i) had the minimal missing values, (ii) represented key behavioral attitudes, and (iii) could be used as multidisciplinary explanatory variables to predict job satisfaction. This selection provided 50 variables, excluding a job satisfaction variable. In order to further reduce the number of variables, an explanatory factor analysis was conducted. Ten factors were specified for extraction using the maximum likelihood method with eigen values of one or above. The data were rotated to obtain an orthogonal factor structure by the Varimax rotation procedure. Orthogonality or independence of a factor from another factor was desired for the second stage of the analysis where factor scores were used as predictor variables in logit regressions. Eight factors composed of significant variable loadings ($r > .27$) were identified. The factor structure is shown in Table 1. The SAS variable number column in this Table indicates the original variable numbers selected for Statistical Analysis System analysis. The eight factor solution was indicated by the eigen values as well as by the scree test. The scree test was the determination of a point after which the factors became unstable. The unweighted eigen values of the eight factors were 5.26, 4.34,

TABLE 1

ROTATED FACTOR STRUCTURE

SAS Variable No.	Variable Name		Factor 1: Positive Army Impact	Factor 2: Exit - Dissatis- faction with environment	Factor 3 Exit- Family Problems
E019	Enlisted for self-improvement		.35	-.01	-.01
E039	Army Impact:	Development of job skills	.49	-.11	.02
E040	Army Impact:	Self-confidence	.74	-.09	-.03
E041	Army Impact:	Leadership ability	.70	-.08	.00
E042	Army Impact:	Ability to work with others	.72	-.07	.01
E043	Army Impact:	Respect for authority	.61	-.22	.04
E044	Army Impact:	Pride in self	.77	-.06	-.02
E045	Army Impact:	Openness to new ideas	.62	-.09	-.02
E046	Army Impact:	Pride in serving Country	.52	-.16	.00
E047	Army Impact:	Ability to make friends	.60	-.05	.01
E048	Army Impact:	Establishing Independence	.63	-.02	-.00
E049	Army Impact:	Self-discipline	.70	-.08	-.01

TABLE 1 (continued)

ROTATED FACTOR STRUCTURE

SAS Variable No.	Variable Name		Factor 1: Positive Army Impact	Factor 2: Exit – Dissatis- faction with environment	Factor 3 Exit- Family Problems
E053	Exit Reasons:	Apathetic Officers	-.03	.66	.05
E054	Exit Reasons:	Failed to get Promoted	.01	.48	.10
E055	Exit Reasons:	Poor NCO Leader- ship	-.05	.66	.03
E056	Exit Reasons:	Pay was too low	-.04	.35	.30
E059	Exit Reasons:	Long working hours	-.07	.39	.40
E060	Exit Reasons:	No credit for good work	-.04	.73	.15
E063	Exit Reasons:	Lacked training wanted	-.08	.32	.14
E064	Exit Reasons:	Didn't get along with NCOs	-.16	.51	.09
E066	Exit Reasons:	Too many rules	-.21	.39	.21
E068	Exit Reasons:	Didn't get along with peers	-.12	.27	.19
E070	Exit Reasons:	Too much unfair treatment	-.11	.76	-.01
E071	Exit Reasons:	Uninteresting work	-.15	.51	.11
E072	Exit Reasons:	Inadequate family services	-.01	.28	.48
E074	Exit Reasons:	Not given respect	-.14	.79	.08

TABLE 1 (continued)

ROTATED FACTOR STRUCTURE

SAS Variable No.	Variable Name		Factor 1: Positive Army Impact	Factor 2: Exit – Dissatis- faction with environment	Factor 3 Exit- Family Problems
E057	Exit Reasons:	Too many PCS moves	.05	.15	.49
E058	Exit Reasons:	Pay was too low	-.05	.35	.31
E059	Exit Reasons:	Long working hours	-.06	.39	.40
E061	Exit Reasons:	Too much family separation	-.01	.11	.66
E065	Exit Reasons:	Family problems at home	.00	.04	.51
E069	Exit Reasons:	Family wanted out	.01	.03	.49
E072	Exit Reasons:	Inadequate family services	-.01	.28	.49

TABLE 1 (continued)

ROTATED FACTOR STRUCTURE

SAS Variable No.	Variable Name	Factor 4: Education Levels	Factor 5: Schooling/ Training Motive	Factor 6 Personal Improvement
E001	Pre-enlistment education	.66	-.05	.01
E002	Education level when left Army	.97	-.02	.04
E003	Current Education level	.66	-.09	.06
E021	Enlistment Reasons: Money for college	-.09	.59	-.07
E062	Exit Reasons: To go to school/ college	-.08	.86	-.02
E063	Exit Reasons: Lacked training wanted	.02	.51	.03
E073	Exit Reasons: To use service benefits	-.04	.57	.05
E023	Enlistment Reasons: Unemployed	.04	.00	.33
E024	Enlistment Reason: Prove I could do it	.05	-.04	.51
E025	Enlistment Reason: To be on my own	.01	.02	.66
E026	Enlistment Reason: To earn more money	.04	.08	.47
E027	Enlistment Reason: Travel	.01	.04	.37
E028	Enlistment Reason: Personal Problem	-.01	-.00	.37
E030	Enlistment Reason: To mature	.02	.05	.46

9

TABLE 1 (continued)

ROTATED FACTOR STRUCTURE

SAS Variable No.	Variable Name	Factor 7: Institutional Soldier	Factor 8: Occupational Soldier
E022	Enlistment Reason: To serve my country	.79	.11
E029	Enlistment Reason: Family Tradition	.29	-.06
E046	Army Impact: Pride in serving country	.51	.02
E019	Enlistment Reason: Self-improvement	. . .	.46
E020	Enlistment Reason: Develop a skill	-.01	.69
E026	Enlistment Reason: Earn more money	-.05	.36

2.00, 1.89, 1.85, 1.81, 1.15, and 1.09. Together these factors were explained 58.85 percent of the total variance in the correlation matrix.

The results of the factor analysis are displayed in Table 1. The first factor in labelled as the "positive Army impact". It is comprised of twelve related variables. The second factor represented separates who were dissatisfied with their environment. This factor contained 14 variables. The third factor, ("Exit for family problems") included seven family-related variables. The fourth and the fifth factors respectively denote educational levels and schooling/training motivations of the soldiers. The sixth factor is comprised of soldiers who enlisted for personal improvement. The last two factors represent the two conflicting motives of "institutional" (or patriotic soldiers who view military service as a calling) versus the "occupational" (or the economically motivated) soldiers. The latter group views the military service as a job (Moskos, 1977; Stahl, et al., 1978, 1980; Segal, 1986; Tremble and Brosvic, 1986).

Analysis of intersections of variables across factors revealed that there were only three intersecting variables out of 50. For instance, variables "E058-Exit because pay was too low" and "E059-Exit for long working hours" were included in two factors: "Factor 2: Dissatisfaction with environment and "Factor 3: Exit for Family problems". Similarly, variable "E072: Exit for inadequate family services" was included in both "Factor 2: Dissatisfaction with environment" and "Factor 3: Exit for family problems". Hence we tend to conclude that the factor structure was representative of the clusters and the factor scores can be used to explain job satisfaction in the U.S. Army.

3.0 Logit Model of Satisfaction with Army Service

Job satisfaction is generally measured in terms of an overall job satisfaction by asking respondents whether they are satisfied or dissatisfied with their jobs. Empirically, it is traditionally measured on a four-point Likert scale varying from very satisfied to very dissatisfied (Locke et al., 1964). A study of recent efforts at changing this scale notes that "it is not clear whether many of the newer measures are, in fact, measuring the same thing as a simple satisfaction rating" (Wanous and Lawler, 1972). Therefore, the satisfaction level of the veterans in this study is determined from responses to the question: "How satisfied were you with your Army service". The responses were coded on a four-point Likert scale: very satisfied, satisfied, dissatisfied and very dissatisfied. I combined the first and the second responses to represent veterans generally satisfied with Army service and the last two responses to indicate generally dissatisfied veterans. The satisfied veterans were assigned a binary value of one and the dissatisfied individuals were given a value of zero. Out of 4,326 veterans with valid responses, 75 percent had a value of 1. This binary variable was used as a criterion (dependent, endogenous, predicted) variable to explain satisfaction with Army service. I used a non-linear logistic regression model to explain job satisfaction because the criterion variable is discontinuous so that ordinary least squares equations are ill-advised (McKelvey and Zavolina, 1975; Amemiya, 1981; Maddala, 1983; Ben-Akiva, 1986). A maximum likelihood procedure is used to obtain the model parameter estimates. The weighted data developed in the Army Experience Survey discussed in the preceding section are used to estimate logistic regressions. The available literature in statistics indicates that the use of weighted data in regression analysis yields unbiased, albeit less efficient, estimates of the

11

population relative to the use of unweighed data (Smith, 1976; Choi, 1982). The predictor variables used to explain job satisfaction are the eight individual factor scores as well as several other variables discussed below.

Satisfaction with Army service is an approximate affective psychological variable for job satisfaction. It is recognized that this variable does not refer to job satisfaction in a specific military occupational specialty (MOS) such as infantry, armor or electronics maintenance. The information on specific occupation cannot be used because the Army Experience Survey did not include a question on MOS. Even as it did, the number of degrees of freedom available for estimation of separate equations for each occupation would be too small to be acceptable statistically. The overall job satisfaction in this analysis is postulated as a function of eight factors scores, while controlling for several other explanatory variables. The hypothesized relationships of these factor scores with job satisfaction is shown in Table 2 and is explained as follows: First, the positive Army impact (factor 1) is expected to explain satisfaction with Army service positively because of the soldiers' perceptions of receiving long term benefits. Second, soldiers who were dissatisfied with their environment while in the Army service (factor 2) are postulated to be negatively related to satisfaction with Army service. Third, veterans who stated that they separated because of family problems in the Army (factor 3) are expected to be negatively related to satisfaction with Army service. Fourth, individuals who made educational progress (factor 4) are likely to be positively related to satisfaction with Army service since the Army facilitated continuation of their education. Fifth, soldiers who joined the Army with schooling/training motive (factor 5) and left thereafter to go to college are predicted to be satisfied with Army service because of the achievement of their college objective. Sixth, enlistees who joined the Army for personal improvement (factor 6) are also expected to be satisfied with Army service. Seventh, the institutional soldiers (factor 7) are expected to be positively related to satisfaction with Army service. Eighth, the occupational soldiers (factor 8) are expected to be negatively related to satisfaction with Army service because they tend to look upon the service as a job rather than a patriotic duty.

The relationships of the other predictor variables to satisfaction with Army service are as follows: (i) **Age** is expected to be negative because older persons generally find it difficult to adjust to the dynamic, youthful, environment in the Army because of biological aging that restrict the duties of enlisted soldiers such as sensorimotor performance, muscle strength, visual acuity, reaction time and balance. This negative relationship is likely to be particularly valid for the first term soldiers that predominate this sample. For the mid-career and career soldiers, as well as for officers, one can expect a positive relationship of age, as is true in some civilian literature (Rhodes, 1983). (ii) **Black** soldiers are likely to be satisfied with Army service because of the elimination of segregation from the Army long before it was eliminated in the rest of the country (Moskos, 1986). (iii) **Married** soldiers, in general, and (iv) **soldiers with children,** in particular, are likely to be negatively related to satisfaction with Army service because the Army requires frequent permanent changes of station (PCS) movements which tend to disrupt family life. (v) An increase in the number of **enlistment** terms served by a soldier is expected to increase satisfaction with Army service because it tends to reflect the soldier's career commitment. (vi) **Higher education of a soldier at the time of enlistment** is expected to be positively related to satisfaction with Army service because it enables comprehending the complex technology of the current

12

TABLE 2

Hypothesized Relationships to Job Satisfaction

Explanatory Variable	Expected Relationship
Factor 1: Positive Army Impact on Employees	+
Factor 2: Exit - Dissatisfaction with Environment	-
Factor 3: Exit - Family Problems	-
Factor 4: Educational Progress Achieved	+
Factor 5: Schooling/Training Motive for Enlistment	+
Factor 6: Personal Improvement Motive for Enlistment	+
Factor 7: Institutional/Patriotic Soldier	+
Factor 8: Occupational/Economic Soldier	-
Age	-
Black	+
Married	-
Number of Enlistment Terms Served	+
Education at Enlistment	+
Enlistment Bonus Recipients	+
Male	?
Veteran's Income	+
Family Income of Veteran	-
Effect of Army Service on Satisfaction of Relationship with Spouse	+
Effect of Army Service on Satisfaction of Relationship with Children	+
Attritees	-
Career-intentional Soldiers	+
Number of Children	-

weapon systems (Binkin, 1985). (vii) Soldiers who enlisted to earn **enlistment bonuses** paid in specific, hard to fill, occupations are expected to be positively related to satisfaction with Army service since they achieved their objective of extra money. (vii) **Male** soldiers are expected to be satisfied with Army service relative to female because the composition of the Army is predominantly male. The female soldiers can, however, be more satisfied than male because the former are not allowed to serve in such arduous and dangerous occupations as combat arms. Female soldiers in the non-combat occupations with easy transferability to civilian sector are, therefore, likely to be more satisfied relative to male soldiers in occupations that are not readily transferable to civilian sector (Lakhani, 1987). In short, the sign of this predictor variable can go in either direction depending on the relative strength of the two opposite forces of traditional Army versus non-traditional occupations. (ix) An increase in **veteran's income** is expected to relate positively to satisfaction with Army Service because the veteran is presumably realizing the rewards of his skill developed during Army service. (x) An increase in the **family income** of the veteran after separation is expected to be negatively related to satisfaction with Army service because the potential income of the spouse of the soldier was not fully realized while the veteran was in the Army service. The loss in family income is attributed to underemployment of spouses due to frequent transfers in areas of inadequate demand for employment. This potential income loss would tend to decrease his perception of satisfaction with Army service. (xi) An increase in **the effect of Army service on satisfaction with spousal relationship** is expected to increase satisfaction with Army service because job satisfaction is not independent of family satisfaction in a cooperative model of partnership of families and the Army (Bowen, 1985). This variable is assumed to be a proxy for several family related Army programs that strive to increase a soldier's satisfaction of relationship with spouse. Examples of these programs are child care centers, spouse employment assistance, continuing education, etc. This variable was developed from the question: "If you were married during Army service, what type of effect, if any, did your Army service have on your relationship with spouse?" The five point response scale -- from strong positive effect to strong negative effect -- was converted to a binary variable by defining the positive effects = 1, negative effects = 0 and excluding the no effect responses. (xii) **The effect of Army service on satisfaction of relationship with children** is also expected to increase satisfaction with Army service because it is part of satisfaction with family. Examples of these programs are Department of Defense Dependents Schools, drug abuse, youth programs, etc. This variable is developed from a question similar to that in (xi). (xii) Soldiers who **involuntarily attrited** from the Army prior to completion of their first term of service are likely to be dissatisfied with their jobs. This is because most of the first term attrition is due to failure to complete training which takes place during the first six months (Weiland, et al., 1986). This variable is used only for Reserve/NG jobs to determine if attritees are satisfied in Reserve/National Guard Units. (xiv) Soldiers who intended to **make the Army a career** at the time of their enlistment are likely to be satisfied with the Army. (xv) An increase in the **number of children** of a soldier is likely to decrease job satisfaction with the Army perhaps because of the family problems associated with the changes in schools, friends, etc., due to permanent change of stations every three years.

The estimated model coefficients are shown in Table 3. The log likelihood ratio (analogous to R-squared) and its associated model Chi Square statistic are significant. All of the coefficients for the predictor variables bear the

14

TABLE 3

Logit Regression for Job Satisfaction with Army Service

Predictor Variables	Beta Coefficient	Chi Squared
Factor 1: Positive Army Impact	.97**	184.13
Factor 2: Exit for Dissatisfaction with Environment	-1.14**	267.78
Factor 3: Exit for Family Problems	-.01	.01
Factor 4: Educational Progress Achieved	.03	.20
Factor 5: Schooling/Training Motive for Enlistment	.06	.59
Factor 6: Personal Improvement Motive for Enlistmen..	.13*	2.76
Factor 7: Institutional/Patriotic Soldier	.23**	11.63
Factor 8: Occupational/Economic Soldier	-.03	.21
Age	-.02	1.93
Black	.09	0.37
Married	-.21	1.60
Number of Children	-.07	0.99
Number of Enlistment Terms Served	.42**	20.97
Education at Enlistment	.04	0.82
Enlistment Bonus Recipients	.09	.50
Male	-.42**	6.08
Veteran's Income	.02*	3.06
Family Income of Veteran	-.00	.02
Effect of Army Service on Satisfaction of Relationship with Spouse During Army Service	.39*	2.64
Effect of Army Service on Satisfaction of Relationship with Children During Army Service	.25	.98
Intercept	1.11*	5.13

N=2,232

-2 log likelihood ratio (with intercept) = 2,536.29

Model Chi Square = 592.63

* Significant at the 0.10 level

** Significant at the 0.01 level

15

hypothesized signs. Eight variables bear expected relationships with the criterion variable and their coefficients, discussed below, are also statistically significant at the 0.10 or 0.01 level. First, veterans who were impacted positively by Army service (factor 1) were more satisfied with Army service. Second, veterans who were dissatisfied with their environment (factor 2) were relatively dissatisfied with Army service. Table 1 shows that this factor includes such variables as apathetic officers, failed to get promoted, poor non-commissioned Officers leadership, too many rules, inadequate family services, etc. Third, veterans who had joined the Army for personal improvement reasons (factor 6) were more satisfied with Army service. The variable constituting this factor included: avoiding unemployment, to be on my own, to prove I could do it, to travel, to earn more money, to mature, etc. Fourth, the institutional or patriotic soldiers (factor 7) were more satisfied with Army service. Fifth, an increase in the number of terms served, a proxy for career commitment behavior, was associated with an increase in the probability of being satisfied with the Army service. Sixth, male soldiers were generally less satisfied with Army service relative to female soldiers. Seventh, an less satisfied with Army service relative to female soldiers. Seventh, an increase in the monthly civilian income earned by a veteran tended to increase the satisfaction level with the Army service. Eighth, the effect of Army service on satisfaction of relationship with spouse while in the Army increased satisfaction with Army service. The remaining variables bear the expected signs but are not statistically significant. In particular, it must be noted that the effect of Army service on satisfaction of relationship with children is not significant because many of these first term separates did not have the children.

It is difficult to determine the relative importance of variables of specific disciplines because the units of measurements, such as the scales, used for them are not uniform. Also, some of the variables, such as income, are continuous whereas others are either factor scores or categorical variables. In particular, the factor scores comprise of clusters of several interdisciplinary variables. Assuming, however, that the size of a Beta coefficient roughly indicates its relative importance, as is done in the literature (Waite and Berryman, 1985), one may venture an inference for the non-factor score variables. The variables that increase job satisfaction, in the order of their importance, are: (i) the number of enlistment terms served (0.42) (ii) the effect of Army Service on Satisfaction of Relationship with Spouse During Army Service (0.39) and (iii) veteran's income (0.02). These three variables are from sociology, psychology and economics respectively. The only variable that significantly decreased job satisfaction was the increase in the number of male soldiers (-0.42) because female soldiers tended to be relatively satisfied with their Army jobs. Hence this demographic or sociological variable tended to reduce job satisfaction.

To sum up, it is observed that job satisfaction is related to the economic, psychological and sociological variables. The economic variables that increased job satisfaction include military pay and the human capital contributed by schooling/training in the Army. For example, a 10 percent increase in veteran income increased the probability of job satisfaction by 2 percent. The psychological variables that decreased job satisfaction consisted of dissatisfaction with the Army environment and those that increased job satisfaction included career commitment denoted by increase in the number of terms served and personal improvement motives for enlistment. An increase in the number of terms served by one, a psychological index of career commitment, tended to increase the probability of job satisfaction by about 0.4 percent. The sociological

16

variables that increase job satisfaction included patriotism and satisfaction with family life as reflected in satisfaction with spousal relationships. An increase in the effect of Army on satisfaction of relationship with spouse by one percent increase job satisfaction by 0.4 percent. Therefore, reliance on **the research from only one of the disciplines by policy decision makers will tend to bias the outcomes.**

3.1 Logit Model of Job Satisfaction in Army Reserve/National Guard Service

Soldiers separating from the Army can be induced to join the Army Reserve force or the National Guard units. The reserve force soldiers serve either as Individual Ready Reserve or Select Reserve. This service helps the Army maintain readiness at a lower cost (compared to the cost of increasing the size of active Army) because these soldiers have been already trained. It helps the reservists use their Army training and experience; and also earn reserve pay, retirements points (which count as partial credit toward continuation of active **serve retirement benefits), and such other Army benefits as the use of Post** Exchange and commissary facilities. This mutual advantage can be increased if more veterans join and continue to remain in the Reserve/National Guard Units. The continuation rate would depend upon their satisfaction with the reserve units. In order to determine the extent to which they were satisfied, the veteran who had already joined the Reserve/National Guard units were asked, "How satisfied are you with your National Guard or Reserve Unit?". The four point response scale on "very satisfied" to "very dissatisfied" was used to develop a binary variable = 1 for "very satisfied" and "satisfied" and =) for **dissatisfied" and "very dissatisfied."** This binary variable, used as a criterion variable in a logit model, *was stipulated as a function of several* multidisciplinary variables discussed below.

Satisfaction with Reserve/National Guard units is analogous to overall job satisfaction or satisfaction with Army service because service in the Reserve/ National Guard is considered as a second job (Shishko and Rostker, 1976). Therefore, we postulated the same set or eight factor scores and other variables used in the preceding sub-section to explain satisfaction with Army service. We also added three other predictor variables. First, an "attritees" variable was added for those who attrited from the Army involuntarily. As noted earlier, it was hypothesized to explain satisfaction with Reserve/National Guard units negatively because they failed to complete their active duty service. Workers who are separated involuntarily generally bear a grudge against their employers and hence are likely to be dissatisfied. Second, an Army "career-intentional soldiers" variable was added. This variable represented soldiers who had responded that they had intended to make the Army a career at the time of their enlistment in the active force. This variable was postulated to explain job satisfaction in the Reserve/NG positively perhaps because they separated from the Army for family problems but voluntarily continued their career intentions by joining the Reserve/NG Units. Third, we added a variable for soldiers who responded that they were satisfied with their Army service. These veterans are likely to be satisfied with Reserve/National Guard jobs because these jobs are similar to their active duty jobs.

The estimated coefficients are shown in Table 4. The log likelihood ratio (analogous to R-square) and its associated model Chi Square statistic are significant. All of the coefficients for the predictor variables bear the hypothesized signs. Ten coefficients, discussed below, are statistically

17

TABLE 4

Logit Regression for Satisfaction with Reserve/National Guard Units

Predictor Variable	Beta Coefficient	Chi Square
Factor 1: Positive Army Impact	0.21**	6.93
Factor 2: Exit for Dissatisfaction with Environment	-.13*	3.41
Factor 3: Exit for Family Problems	-.09	1.68
Factor 4: Educational Progress Achieved	.01	.01
Factor 5: Schooling/Training Motive for Enlistment	.17**	5.44
Factor 6: Personal Improvement Reason for Enlistment	.07	.90
Factor 7: Institutional/Patriotic Soldier	.24**	9.64
Factor 8: Occupational/Economic Soldier	-.05	.46
Satisfied with Army	.03	.04
Effect of Army Service on Satisfaction		
of Relationship with Spouse During Army Service	.30*	2.73
Effect of Army Service on Satisfaction		
of Relationship with Children During Army Service	-.09	.17
Valuable Army Experience	.29	1.57
Age	-.02	.84
Black	.35*	5.32
Number of Enlistment Terms Served	-.07	.39
Male	-.16	1.29
Education at Enlistment	.02	.21
Enlistment Bonus Recipients	.31*	5.05
Number of Children	-.03	.26
Veteran's Income	.01*	4.15
Family Income of Veteran	.00	2.65
Attritees	-2.08**	45.91
Career-intentional Soldiers	.27*	4.61
Intercept	-1.46**	7.59
N=2,232; -2 log likelihood ratio=2,077.50; Chi square=181.4		

* Significant at the 0.10 level

** Significant at the 0.01 level

significant either at the 0.01 or 0.1 level. First, an increase in the Army's positive developmental impact variables (factor 1) tends to increase job satisfaction with Reserve/National Guard units. Second, an increase in dissatisfaction with the environment while they were in the Army (factor 2) tended to decrease job satisfaction level in these units. Third, an increase in the soldiers who had enlisted in the active Army for schooling/training motive (factor 5) had increased job satisfaction level with these units. Fourth, an increase in the institutional orientation or soldiers (factor 7) increased satisfaction with Army Reserve/National Guard units. Fifth, an increase in the effect of Army service on satisfaction or relationship with spouse during service increased job satisfaction in the Reserve/National Guard units. Sixth, black soldiers were more satisfied with these units relative to non-black soldiers. Seventh, recipients of enlistment bonuses were more satisfied with these units relative to non-recipients. Eighth, an increase in veteran's income tends to increase job satisfaction with these units. Ninth, attritees from the Army were more dissatisfied with jobs in the units relative to non-attritees. Finally, veterans who intended to make Army a career at the time of their enlistments were more satisfied with these units relative to soldiers who did not intend to make the Army a career.

To sum up, variables from all the three disciplines play a part in explaining job satisfaction. The relative importance of these disciplines cannot be separated out for factor scores since they are a composite of variables from all the three disciplines. The non-factor score variables, however, reveal that the most important (coefficient = .35) variable that increases job satisfaction in these units is race (sociological or demographic) -- an increase in black soldiers tends to increase their job satisfaction. This is followed by the economic variable on enlistment bonus recipients (.31) and the sociological variable on increase in the effect of Army service on satisfaction of relationship with spouse during Army service (.30). The fourth significant variable is, once again, economic, namely veterans income (.01). It must be noted that the list of significant variables in explaining job satisfaction in the Reserve/NG units is similar to the variables explaingin job satisfaction of the veterans while they were in the active Army. Hence, it appears that there is no difference in the factors contributing to the satisfaction of the respondents whether they are currently working on their jobs or they are recollecting their job experience.

4.0 Conclusions and Policy Implications

Job satisfaction in the Army as well as in the Reserve/ National Guard units is explained significantly by several interdisciplinary variables. The economic variables that explain job satisfaction positively are comprised of such reasons for joining the Army as avoiding unemployment and the desire to earn more money. The economic reasons for job dissatisfaction and hence separating from the Army include "pay was to low". An increase in "veteran's income" after separation increases job satisfaction because the economic returns to Army training are realized in the civilian world. The psychological variables explaining job dissatisfaction include such environmental reasons for leaving the Army as "apathetic officers" and "didn't get along with peers/non-commissioned officers". The psychological variables that increase job satisfaction include career commitment denoted by an increase in the number of terms served and personal improvement motives for enlistment. The sociological variables that increase job satisfaction in the Army include the "desire to

serve my country", family tradition to serve the country", pride in servicing country", and "satisfaction in the Army include the "desire to serve my country", family tradition to serve the country", "pride in serving country", and "satisfaction with family life". It is important to emphasize that job satisfaction increases with satisfaction with family life which is represented by the effect of Army service on satisfaction with spousal relationship variable in my model. Also, black soldiers and servicemen who were recipients of enlistment bonuses and/or the GI bill benefits for education/training were more satisfied with their jobs relative to non-blacks and the non-recipients.

One of the policy implications that emerges from this analysis is that job satisfaction is a multi-dimensional issue. These dimensions include economic, psychological and sociological variables. Hence, job satisfaction can be increased by changing such economic variables as military pay as well as changing the job environment emphasized by social psychologists. The job environment can be improved by reducing apathetic officers, increasing promotions, reducing work hours, reducing the number of rules, ensuring equitable treatment, giving credit for good work, providing appropriate training, increasing cooperative peers, enhancing self-confidence of the employees, etc. The sociological variables to improve job satisfaction comprise of increasing satisfaction of the soldiers with their families. These consist of the impact of Army family programs on satisfaction of the soldiers with their spouses and children. The soldier's satisfaction level for relationships with spouse and children can be increased by initiating, sustaining and expanding such spouse-oriented programs as child care, spouse employment assistance, financial support for continuing education programs for spouses, library services, community and skill development activities, military clubs, post exchange and commissaries, chaplain's and family counseling services, adequate housing, high quality Department of Defense Dependents Schools (in U.S. Army Europe) and Section 6 schools (in Continental U.S.), Army continuing education system for soldiers, education center testing services, quality health care at a reasonable cost, child development services, youth programs, Army Community Services' Family Advocacy and Child and Spouse Abuse activities, foster care, consumer affairs and financial management assistance centers, exceptional family member assistance, providing relocation and housing referral services, and utility and security deposit waiver. The positive effect produced by these programs can perhaps more than offset the negative contribution made by the required family separations due to deployment, permanent change of station moves, long and strenuous hours of work, apathetic officers, too many rules, unfriendly peers and uninteresting work. The net effect of an increase in family satisfaction can help increase job satisfaction.

SELECTED REFERENCES

Amemiya, Takeshi (1981). "Qualitative Response Models: A Survey," Journal of Economic Literature, XIX (December), 1483-1536.

Baumol, William (1985). Productivity Growth and U.S. Competitiveness (ed.) New York: Oxford University Press.

Ben-Akiva, Moshe and S. R. Lerman (1986). Discrete Choice Analysis. Cambridge, MA: M.I.T.

Binkin, Martin (1986). Military Technology and Defense Manpower. Washington, DC: Brookings.

Blair, John D. and Robert L. Phillips (1983). "Job Satisfaction Among Youth in Military and Civilian Work Settings," Armed Forces and Society, 9(4):555-568, Summer.

Borjes, George J. (1970). "Job Satisfaction, Wages, and Unions," Journal of Human Resources, Winter, 21-41.

Bowen, Gary L. A Framework of Research on Career Decision Making and the Military Family, draft report prepared for the U.S. Army Research Institute, Alexandria, VA, August.

Choi, Jai W. (1982). "Chi Squared Testing of Categorical Data from Nested Design Using the Correction Factor Estimated from Analysis of Variance Components," American Statistical Association: 1982 Proceedings of the Section on Survey Research Methods, 531-536.

Coleman, James S. (1986). "Social Capital in the Development of Human Capital," paper presented at the Annual American Economic Association meetings, New Orleans, 29 December.

Dalton, Amy H. and John Marcis (1986). "The Determinants of Job Satisfaction for Young Males and Females," Atlantic Economic Journal, XIV(3), September.

Elster, Jon (1985). Studies in the Subversion of Rationality. New York: Cambridge University Press, vii, 177.

Etzioni, Amitai (1986). "Rationality is an Exception Rather than the Norm," Journal of Economic Psychology, March; also, The Washington Post, January 18, 1987.

Farkas, George and Paula England (1985). "Integrating the Sociology and Economics of Employment, Compensation, and Unemployment," in Richard L. Simpson and Ida Harper Simpson (eds.), Research in the Sociology of Work, Volume 3, Unemployment, Greenwich, CT: Jai Press.

Farkas, George, D. Libby, and E. Stromsdorfer (1987). "The Determinants of Army Attrition: An Interdisciplinary Approach," paper presented at the Thirteenth Annual Convention of the Eastern Economic Association, March 5, Washington, DC.

Filer, Randall Keith (1981). "The Influence of Affective Human Capital on the Wage Equation," Ronald G. Ehrenberg (ed.), Research in Labor Economics, Vol 4, Greenwich, CT: Jai, 367-416.

Freeman, Richard B. (1978). "Job Satisfaction as an Economic Variable," American Economic Review, May, 135-141.

Fuchs, Victor R. (1986). "Sex Differences in Economic Well-Being," Science, 232:459-464, April 25.

Gollop, Frank M. and Dale W. Jorgenson (1980). "U.S. Productivity Growth by Industry" in John W. Kendrick (ed.), New Developments in Productivity Research. New York: National Bureau of Economic Research.

Herzberg, Frederick, Bernard Mausner, and Barber Snyderman (1959). The Motivation to Work. New York: Wiley, 2d edition, 59-83.

Herzberg, Frederick (1966). Work and the Nature of Man. Cleveland: World Publishing, 74.

Herzberg, Frederick (1968). "One More Time, How Do You Motivate Employees?" Harvard Business Review. XLVI, January-February, 53-62.

Hildebrand, G. H. and T. C. Liu (1965). Manufacturing Production Functions in the United States, 1957. Ithaca, NY: Cornell University Press.

Hirschleifer, Jack (1985). "The Expanding Domain of Economics," American Economic Review, 75(6):53-68, December.

Hopkins, Anne H. (1983). Work and Job Satisfaction in the Public Sector, New Jersey: Rowman & Allanheld, xii, 146.

Kahneman, Daniel and Amos Tversky (1979). "Prospect Theory: An Analysis of Decision Under Risk," Econometrica, 47:263-291, March.

Katzell, R. A. and D. Yankelovich (1975). Work, Productivity and Job Satisfaction. New York: The Psychological Corporation.

Kendrick, J. (1977). Understanding Productivity: An Introduction to the Dynamics of Productivity Change. Baltimore: Johns Hopkins University Press.

Lakhani, Hyder (1987). "Bonuses, Wages, Training Costs and Quit Rates: A Three Stage Least Squares Approach," U.S. Army Research Institute Technical Report 734. Alexandria, VA, February 1987. (AD A179 907)

Lawler, Edward E. (1967). "Attitude Surveys and Job Performance," Personnel Administration, xxx, September-October, 3-ff.

Lea, Stephen E. G., Roger A. Tarpy, and Paul Webley (1987). The Individual in the Economy: A Textbook of Economic Psychology, New York: Cambridge University Press, xxiii:627.

Locke, E. A., P. C. Smith, L. M. Kendall, C. L. Hulin, and A. M. Miller (1964). "Convergent and Discriminant Validity for Areas and Methods of Rating Job Satisfaction," Journal of Applied Psychology, 48:313-319.

Maddala, G. S. (1983). Limited-dependent and Qualitative Variables in Econometrics, New York: Cambridge University Press.

Mangum, Stephen L. and David E. Ball (1987). "Military Provided Occupational Training and Skill Transfer in the Post-Draft Era," Armed Forces and Society. (forthcoming)

March, James G. and Herbert A. Simon (1958). Organizations. New York: Wiley, 51.

McKelvey, R. and W. Zavolina (1975). "A Statistical Model for the Analysis of Ordinal Level Dependent Variables," Journal of Mathematical Sociology, Summer, 103-120.

Moskos, Charles C. (1977). "From Institution to Occupation: Trends in Military Organization," Armed Forces and Society, 4:41-50.

Norsworthy, J. R. and Craig A. Zabala (1985). "Worker Attitudes, Worker Behavior and Productivity in the U.S. Automobile Industry, 1959-1976," Industrial and Labor Relations Review, 38(4):544-557, July.

Parker, William E. and Robert W. Kleemeier (1951). Human Relations in Supervision: Leadership in Management. New York: McGraw-Hill, 10.

Porter, Lyman W. and Edward E. Lawler, III (1968). "What Job Attitudes Tell About Motivation," Harvard Business Review. XLVI:118-136, January-February.

Rhodes, Susan R. (1983). "Age-Related Differences in Work Attitudes and Behavior: A Review and Conceptual Analysis," Psychological Bulletin, 93(2):328-367.

Ronan, W. W. (1970). "Individual and Situational Variables Relating to Job Satisfaction," Journal of Applied Psychology, 54:1-31.

Schoemaker, J. H. (1982). "The Expected Utility Model: Its Variants, Purposes, Evidence and Limitations," Journal of Economic Literature, XX:529-563, June.

Schwab, Donald P. and Larry L. Cummins (1970). "Theories of Performance and Satisfaction," Industrial Relations. 9:408-430.

Segal, David R. (1986). "Measuring the Institutional/Occupational Change Thesis," Armed Forces and Society, 3:351-376.

Shishko, Robert and Bernard Rostker (1976). "The Economics of Multiple Job Holding," American Economic Review, 66(3):298-308.

Simon, Herbert A. (1959). "Theories of Decision Making in Economics," American Economic Review, XLIX, June.

Smith, Kent W. (1976). "Analyzing Disproportionately Stratified Samples with Computerized Statistical Packages," Sociological Methods and Research, 5(2):220, November.

Stahl, Michael, J. Manley, T. Roger, and Charles W. McNichols (1978). "Operationalyzing the Moskos Institutional-Occupational Model: An Application of Gouldner's Cosmopolitan-Local Research," Journal of Applied Psychology, 63(4):422-427; and (1980). "An Empirical Examination of Moskos Institution-Occupation Model," Armed Forces and Society, 6:257-269.

Strauss, George (1967). "Human Relations--1968 Style," Industrial Relations, VII, 264, May.

Thaler, Richard (1980). "Toward a Positive Theory of Consumer Choice," Journal of Economic Behavior and Organization, 1:39-60.

Tremble, Trueman R. and Gary M. Brosvic (1986). "Institutional-Occupational Role Orientations and Retention in the Military," paper presented at the 94th Annual Convention of the American Psychological Association at Washington, DC, August.

Vroom, V. (1964). Work and Motivation. New York: Wiley.

Waite, Linda J. and Sue E. Berryman (1985). Women in Nontraditional Occupations: Choice and Turnover. RAND Report R-3106-FF, March, p. 56, for the Ford Foundation, Santa Monica, CA.

Walters, A. A. (1968). "Econometric Studies of Production and Cost Functions," Encyclopedia of the Social Sciences.

Wanous, John P. and Edward E. Lawler, III (1972). "Measurement and Meaning of Job Satisfaction," Journal of Applied Psychology, 56(2):954-105.

Weiland, Thomas A., Edward Schmitz, David Horne, and Curtis Gilroy (1986). "Determinant of Army Attrition: An MOS-Specific Model," U.S. Army Research Institute Working Paper, MPPRG 87-5, October, Alexandria, VA.

Westat, Inc. Task 4: The 1984-1985 ARI Alumni Survey: Sample Design, draft report prepared for the U.S. Army Research Institute, Alexandria, VA, March.

Westat, Inc. (1986). <u>The 1985 Army Experience Survey Data Sourcebook and User's Manual</u>, Research Note 86-01 (AD A173 826) prepared for the U.S. Army Research Institute, Alexandria, VA, January; <u>Tabular Descriptions of First Term Separates, Volumes 1 and 2</u>, Research Product 86-01 (AD A174 819) and 86-02 (AD A174 868) prepared for the U.S. Army Research Institute, Alexandria, VA, January.

Willis, Robert J. (1986). "What Have We Learned from the Economics of the Family?" paper presented at the Annual Meetings of the American Economic Association, New Orleans, December 28; also, University of Chicago/NORC Discussion Paper No. 87-1.